

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**LISTING OF CLAIMS:**

1. (Currently Amended) A system for controlling and optimizing emissions of a catalytic combustor in a gas turbine including a compressor and a turbine, the system comprising:

at least one calculation unit configured to implement a mathematical model of an operation of the gas turbine,

wherein the mathematical model links a flow rate of a bleed system of the compressor to (i) an ambient temperature and (ii) a rotation of adjustable vanes that control a fluid entering at the compressor, and

the at least one calculation unit calculatesadjusts the flow rate of the bleed system of the compressor based on the ambient temperature and the rotation of the adjustable vanes of the compressor such that the emissions are optimized during variations of operating conditions of at the turbine over a range of external environmental conditions from approximately -29°C to +49°C.

2. (Cancelled)

3. (Currently Amended) The system according to Claim 1, wherein the at least one calculation unit further uses a compressor inlet pressure and an absolute humidity at the compressor inlet to ~~calculate~~adjust the flow rate of the bleed system, in order to provide greater accuracy.

4. (Previously Presented) The system according to Claim 1, wherein the at least one calculation unit uses values in the range from 0 to -50 degrees for the rotation of the adjustable vanes and in the range from 0 to 5% of the flow rate (W2) for the bleed system, where W2 is the flow rate of air drawn in by the compressor.

5. (Previously Presented) The system of Claim 1, further comprising:  
the compressor configured to draw a fluid at the predetermined flow rate W2;  
the catalytic combustor connected to an outlet of the compressor and including a combustion region, a catalytic cell and a post-combustion region, wherein the combustion region is configured to mix and burn a compressed fluid flow from an exhaust of the compressor with a fuel flow; and  
the turbine connected to the post-combustion region and configured to transform an enthalpy of the burned mixed of fluid from the compressor and the fuel flow into mechanical energy.

6. (Previously Presented) The system of Claim 5, further comprising:

the adjustable vanes provided at an inlet of the compressor and configured to rotate to adjust a fluid flow entering the compressor.

7. (Previously Presented) The system of Claim 6, further comprising:  
the bleed system provided at an outlet of the compressor and configured to remove part of the fluid flow passing through the compressor.

8. (Previously Presented) The system of Claim 7, wherein the removed part of the fluid flow passing through the compressor is returned to an inlet of the compressor.

9. (Previously Presented) The system of claim 1, wherein the at least one calculation unit adjusts the flow rate of the bleed system such that a temperature (T3) at the compressor exhaust is maintained constant over the ambient temperature varying from approximately -29°C to +49°C.